## REMARKS

In view of the following discussion, the Applicants submit that none of the claims now pending in the application is anticipated under the provisions of 35 U.S.C. §102 or made obvious under the provisions of 35 U.S.C. §103. Thus, the Applicants believe that all of these claims are in allowable form.

### I. REJECTION OF CLAIMS 1-7, 11-13, and 15-18 UNDER 35 U.S.C. §102

The Examiner has rejected claims 1-7, 11-13, and 15-18 in the Office Action as being anticipated by Müller et al. ("A Novel Peak Power Reduction scheme for OFDM," The 8th IEEE International Symposium, pages 1090-1094, September 1997), hereafter Müller. The rejection is respectfully traversed.

Müller teaches a method for peak power reduction in Orthogonal Frequency Division Multiplexing (OFDM) that is based upon the coordination of rotated signal block parts. By manipulating phase factors associated with these signal parts, blocks of the transmitted signal are rotated in such a fashion that the peak power of the signal will be minimized. These phase factors may be arranged in an optimized rotation parameter set called the optimum transmit sequence (see Müller, section 4.1, p. 1091).

The Examiner alleges that the embedding of this sequence onto the transmitted data is supported by section 4.1 of Müller (see p.1091), which describes this embedding process as the "rotation of all subcarriers in sub-block v=(1..V) to find the optimum transmit sequence." The Examiner also states that "[t]he sequence is then embedded and transmitted as shown in figure 1, see elements '$b_u(v)$' and 'peak value optimization' and section 4.1" (See Office Action, 1st paragraph, page 3).

The Examiner's attention is directed to the fact that the support for his argument is not referring to the rotation of the subcarriers in the sub-blocks to find the optimum transmit sequence. Rather, the rotation process referenced by the Examiner is directly related to the reduction of the peak power (i.e., the minimization of the peak-to-average power ratio (PAP)). Furthermore, this section does not refer to the embedding of the optimum transmit sequence onto the transmitted signal.

Consequently, this cited section of Müller fails to disclose or teach the novel invention of embedding the PAP-reducing sequence information in the transmitted signal as claimed in Applicants' independent claim 1. Specifically, Applicants' claim 1 positively recites:

1. A method for reducing the PAP ratio in an OFDM system, comprising:
dividing a data block into a plurality of clusters;
determining a respective phase factor for each of the plurality of clusters to form an inversion sequence for reducing the PAP ratio of transmitted data corresponding to the plurality of clusters; and
embedding the inversion sequence onto the transmitted data. (Emphasis added)

The Applicants' invention is directed to a method and apparatus for reducing the PAP ratio in an OFDM system. According to the Applicants' specification, the inversion sequence is embedded onto the transmitted data by rotating tones in each of the clusters based upon a value of an associated phase factor. For example, in one embodiment, binary phase factors (i.e., ±1) are utilized. In the event the inversion sequence does not rotate the cluster (i.e., the cluster phase factor is +1), none of the tones in the cluster are rotated. However, if the inversion sequence does rotate the cluster (i.e., the cluster phase factor is -1), then every other tone in the cluster is rotated by a predetermined amount (e.g., $\pi/4$ radians). The Examiner's cited section of Müller is devoid of any such teaching.

The Examiner's attention is also directed to the fact that Müller fails to disclose or teach the actual method of embedding the PAP-reducing inversion sequences onto transmitted data as claimed in Applicants' independent claim 11. Specifically, Applicants' claim 11 positively recites:

11. A method of embedding PAP-reducing inversion sequences onto transmitted data, comprising:
determining an initial PAP value for a block of symbols;
partitioning the block of symbols into a predetermined number of clusters;
selecting a respective phase factor for each of the clusters so as to form an inversion sequence that reduces a PAP of transmitted data corresponding to the block of symbols; and

embedding the inversion sequence onto the transmitted data by rotating selected tones in each of the clusters based upon a value of the associated phase factor. (Emphasis added)

For the same reasons stated above, the Applicants contend that the cited section of Müller is devoid of any teaching regarding the embedding of sequence information onto the transmitted signal data.

Therefore, the Applicants submit that independent claims 1 and 11 fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder.

Furthermore, dependent claims 2-7, 12-13, and 15-18 depend, either directly or indirectly, from claims 1 and 11 and recite additional features therefor. As such and for the exact same reasons set forth above, the Applicants submit that none of these claims is anticipated by the teachings of Müller. Therefore, the Applicants submit that all these dependent claims also fully satisfy the requirements of 35 U.S.C. §102 and are patentable thereunder.

**II. REJECTION OF CLAIMS 8-10, 14, and 19 UNDER 35 U.S.C. §103**

The Examiner has rejected claims 8-10, 14, and 19 in the Office Action as being obvious over Müller in view of the Sarkar patent (U.S. Patent No. 6,363,060, issued March 26, 2002, hereinafter Sarkar). The rejection is respectfully traversed.

Müller has been discussed above.

Sarkar discloses "a communications transmission system that optimizes data transmission efficiency by measuring the Hamming distance as a validity test of the data." Notably, the Examiner alleges that Sarkar teaches the Hamming distance is a type of Walsh sequence in column 9, lines 20-30 of the patent. This cited section of Sarkar, however, does not mention, teach, or suggest the embedding of sequence information in the transmitted data.

Since Sarkar fails to bridge the gap left by Müller, the Applicants contend that the combination of references Müller and Sarkar do not teach or suggest the Applicants' invention as a whole. In particular, the cited sections of Müller do not teach an embedding process incorporating the rotation of selected tones as disclosed by the

Applicants' invention. Therefore, Müller and Sarkar fail to teach or suggest the Applicants' invention as a whole.

Therefore, even if the two references could somehow be operably combined (and the Applicants submit that the references cannot be properly combined), the resulting combination of Müller and Sarkar would still fail to mention or suggest the embedding of sequence information onto transmitted data as claimed in claims 1 and 11 of the Applicants' invention.

Thus, the Examiner has failed to present a prima facie case of obviousness in combining Müller with Sarkar to arrive at the claimed invention of Applicants' claims 8-10, 14, and 19 since these claims depend, either directly or indirectly, from claims 1 and 11. Therefore, the Applicants submit that claims 8-10, 14, and 19 fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Withdrawal of the rejection is respectfully requested.

## CONCLUSION

Thus, the Applicants submit that all of these claims now fully satisfy the requirements of 35 U.S.C. §102 and 35 U.S.C. §103. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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